TECHNOLOGY & POWER - THE ENERGY CONUNDRUM

SUMMER 2021

iXConsulting

CONTENTS

EXECUTIVE SUMMARY

Welcome to our summer 2021 report which is both insightful and informative, particularly as we start to really understand the lasting impact of the pandemic. The promising news is that confidence in future demand levels is still on an upward trajectory, overall, rising from a 64% positive response in our last survey to 71% today. This is further underpinned by developer and investor respondents being the most positive together since the start of this survey over 10 years ago, with 93% of colocation providers predicting increasing demand levels over the next year. Because of this, we are witnessing a strong growth in the sector with an increase in efficient power infrastructure spending as well as an increase in electricity demand accelerating the emergence of a new electricity intensive industry.

The challenge is increasingly around the availability of power, which remains the most important factor in the decision-making process for a new data centre, ranked first by 85% of developer and investor respondents. Indeed, according to the EU commission, by 2030, electricity consumption of data centres will rise to in the region of 500 TWh of electricity, which will represent over 3% of the world's total energy consumption. Together with the recently reported record take up for the 1st quarter of this year, this has prompted renewed concerns about the pressure this will put on the electricity grids in several of the continent's hubs.

So how can the industry respond? Frankfurt has followed the lead of Amsterdam in announcing plans to ensure that data centre development can grow sustainably but without consuming to many resources, particularly power. Another strategy is that currently being deployed in Dublin which is in a position in that all of the major hyperscale operators have a presence there. This presents the unique challenge of accommodating the colocation demand of the hyperscalers while ensuring there is sufficient capacity in its electricity grid to service them through a grid which is not built to cater for such high demand from data centre providers. This is a situation that will be mirrored across all other leading hubs which is why it is being monitored closely as the Irish government, data centre operators and the energy companies are currently consulting on how best to address the issue. This could provide the blueprint for development across Europe.

In the coming decade, a significant risk exists that rapidly growing demand for information services—and compute-intensive applications like AI in particular—will begin to outpace the efficiency gains that have historically kept data centre energy use in check. Potential remains for substantial efficiency gains, but investments in next-generation computing, storage, and heat removal technologies will be required to avoid potentially steep energy use growth later this decade, and parallel investments in renewable power sourcing will be required to minimize the climate implications of unavoidable data centre energy use.

In response to this we recently launched BCS Utilities, as part of the BCS Group, which operates internationally on offsite utility procurement and delivery strategies; offsite generally referring to the project utility networks adopted, owned and operated by statutory regulated undertakers or third-party independent network providers. We believe that utilities is a specialist area that is often overlooked, with many organisations unaware of the flexibility that is a result of deregulation and that efficiencies which can be as high as 80% with the right solution. With power costs and availability becoming a key focus for the data centre industry alongside sustainability and decarbonisation, this is increasingly key.

James Hart
CEO

Welcome to the 22nd Data Centre Survey, sponsored by BCS who offer integrated solutions and data centre services through IT Asset consultancy. Undertaken by data centre consultancy, iXConsulting, the report analyses the views of a broad cross-section of owners, operators, service providers, developers, investors, consultants and end-users of data centres, providing insight into the ongoing health of technical real estate across Europe.
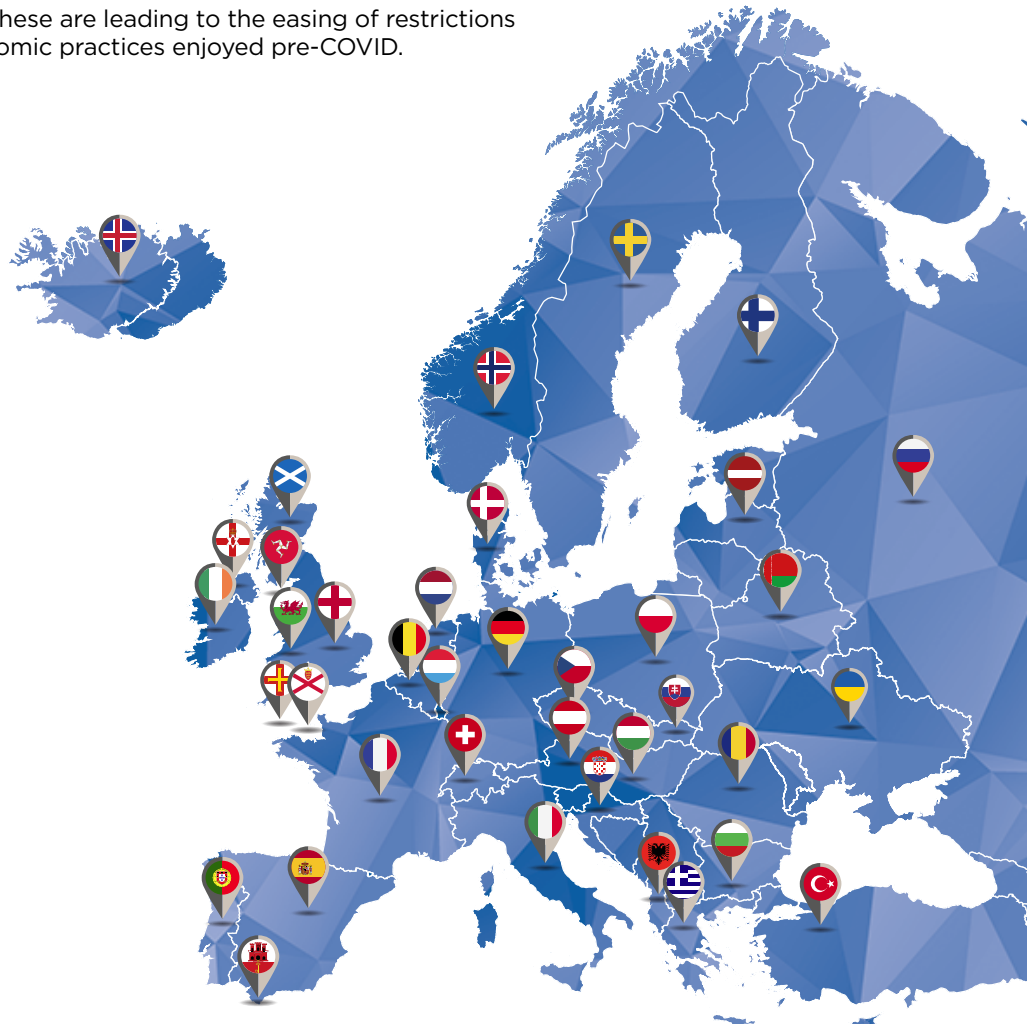
In this latest report, our views are collected from respondents who either own, operate or use just over 4.5 million square meters of technical real estate across 38 European countries, continuing to underpin the longest running and most comprehensive report of its kind in the European data centre industry

WHAT IS YOUR PRIMARY RELATIONSHIP WITH THE DATA CENTRE INDUSTRY?

- Colocation Operator
- Carrier/Network Operator
- IT Integrator/Cloud Provider
- Corporate Occupier
- Real Estate Developer/Investor/Funder
- Design/Engineering/Construction
- Other

For the third report in succession, the survey work has been undertaken against a background of the ongoing global COVID-19 pandemic, although arguably a more benign environment than has been experienced over the last 18 months. But the COVID-19 crisis is still far from behind us, and at the time of writing significant problems in areas such as India where a second wave of rising infections and almost unbearable pressure on their health services, seemingly more deadly than the first wave, reminds us how quickly the virus can take hold and cause significant devastation.
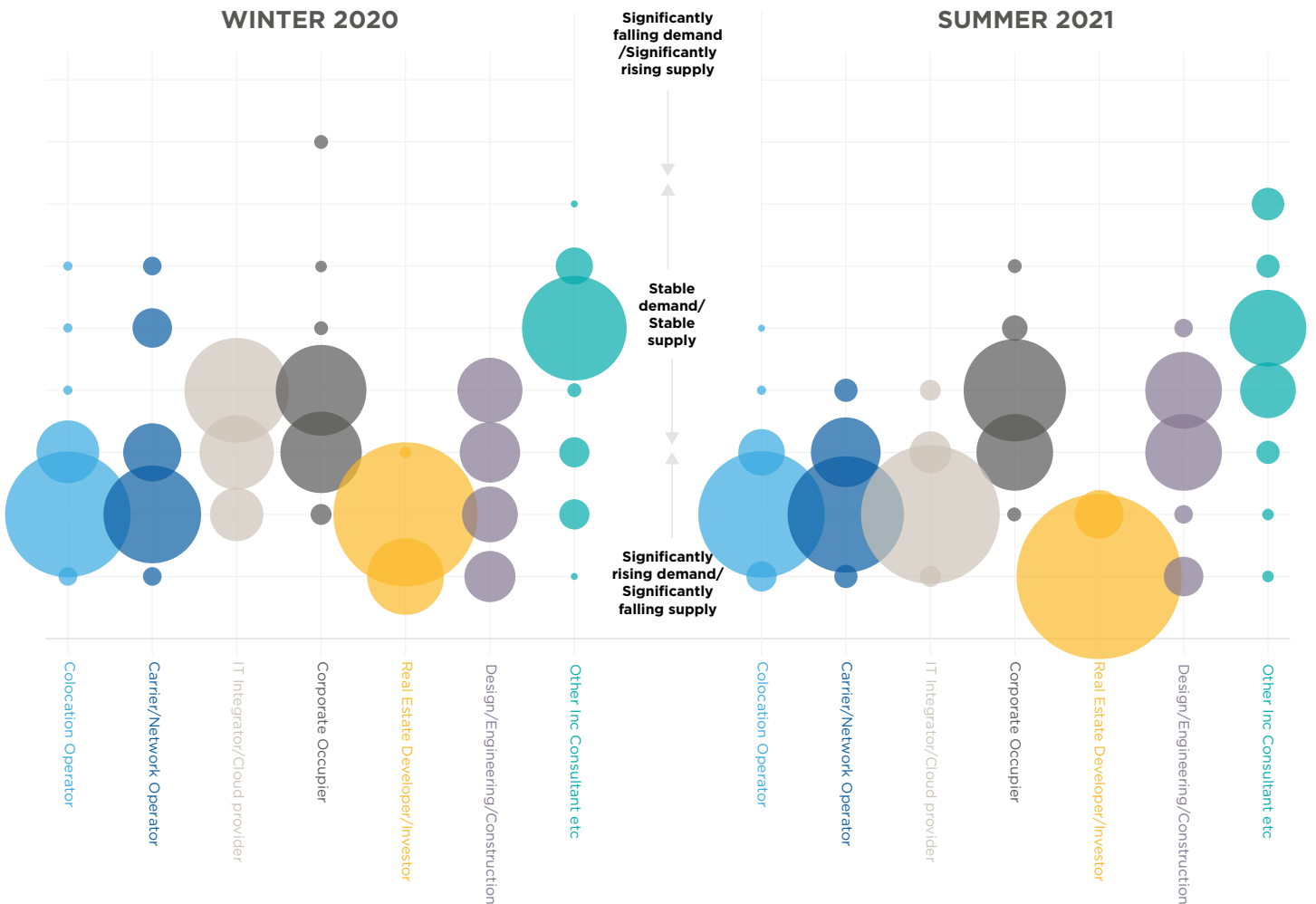
The last two surveys have witnessed our industry's reactions to the early stages of the crises, through the summer and followed by the second wave into the autumn and winter of 2020. Our first survey of 2021 has been undertaken against a background of quite disparate governmental responses across the European landscape.
There have been well-publicised disparities between countries in terms of vaccination programmes and more importantly how these are leading to the easing of restrictions and a move back to both social and economic practices enjoyed pre-COVID.

This disparate context poses a difficult set of challenges for the European data centre industry. The industry does not operate in a bubble and whilst demand for technology-driven services has significantly increased during the pandemic, it also remains susceptible to issues such as global supply chain disruption and workforce mobility restrictions. Nevertheless, the latest survey appears to provide evidence of a greater degree of positivity and optimism regarding prospects for the industry.

THE SUPPLY DEMAND BALANCE

WINTER 2020

SUMMER 2021

Significantly falling demand /Significantly rising supply

Stable demand/ Stable supply

Significantly rising demand/ Significantly falling supply

Colocation Operator
Carrier/Network Operator
IT Integrator/Cloud provider
Corporate Occupier
Real Estate Developer/Investor
Design/Engineering/Construction
Other Inc Consultant etc

- Future demand levels for data centres show no signs of slowing. Some 71% of our respondents believe that the next year will see an increase in such demand, up from 64% reporting the same six months earlier.

- A further 27% of respondents indicated that demand levels will remain stable, whilst just 2% reported a belief that demand will fall in the coming twelve months.

- Developer and investor respondents continue to be the most positive regarding potential levels of demand for data centre space, with all reporting that they expect this growth over the next twelve months.

- Colocation providers remain buoyant; 93% predicting increasing demand levels over the next year.

- Network carriers and integrators are more optimistic than was the case six months ago; around 90% expect to see a rise in demand compared to 75% previously.

- Amongst our corporate respondents, around four-fifths expressed that they believed the market is characterised by rising demand and falling supply levels; broadly in line with that recorded six months ago. 44% share the view that stable demand is allied to falling supply, a similar profile to that reported last winter. In addition, 11% see stability in both the demand and supply sides up from 6%, whilst the balance - around one-in-twenty - see rising supply is allied to falling demand.

OWNERSHIP AND MANAGEMENT MAKE-UP

Maintaining control of their own facilities remains a major requirement for our colocation operators and IT integrators/web hosters; nearly four-fifths reporting that 80% or more of their data centre portfolio was internally managed, a proportion in line with the long-term average. Operating at these levels of control allows these providers the flexibility and speed of decision-making to satisfy changing client demands, whilst continuing to drive efficiencies through their environments without the potential constraints a third-party provider could present.

Whilst this self-managed approach remains popular to the business model for service providers, the contrast with the requirements of most corporate respondents is evident. Once again, amongst end-user respondents a large proportion appear to find the outsourcing solution an attractive option; four-fifths of end-users indicated that at least 80% or more of their portfolio is managed via a third-party, a proportion in line with that monitored in our last survey.

But whilst the benefits of third-party solutions are attractive to many – saving them from large CAPEX outgoings that are needed to build-out data centres and offering service flexibility - there is evidence that a blended approach also appeals. This method mixes the benefits of both external and in-house solutions by maintaining a tighter degree of control over elements of their infrastructure that they wish to remain internally for reasons of security and/or sensitivity.

UTILISATION

It is not surprising that respondents want to ensure that that they are using their data centre footprints in the most efficient manner; this has been a constant feature of our findings since our survey work began some 12 years ago. This efficiency rating is a careful balance between the need to maintain flexibility for future business demands whilst ensuring out-goings on flex-space are minimised and costs capped.

The average utilisation ratios of third-party managed space continue to exceed those for internally managed solutions. The latest survey has largely seen a continuation of this, with the proportion of respondents having utilisation rates of externally managed solutions of 80% or more, rising marginally to 71% whilst the rates of 80% plus in-house utilisation have fallen slightly to 27%.

HOW MUCH OF YOUR CURRENT DATA CENTRE SPACE IS ACTIVE AND BEING USED?
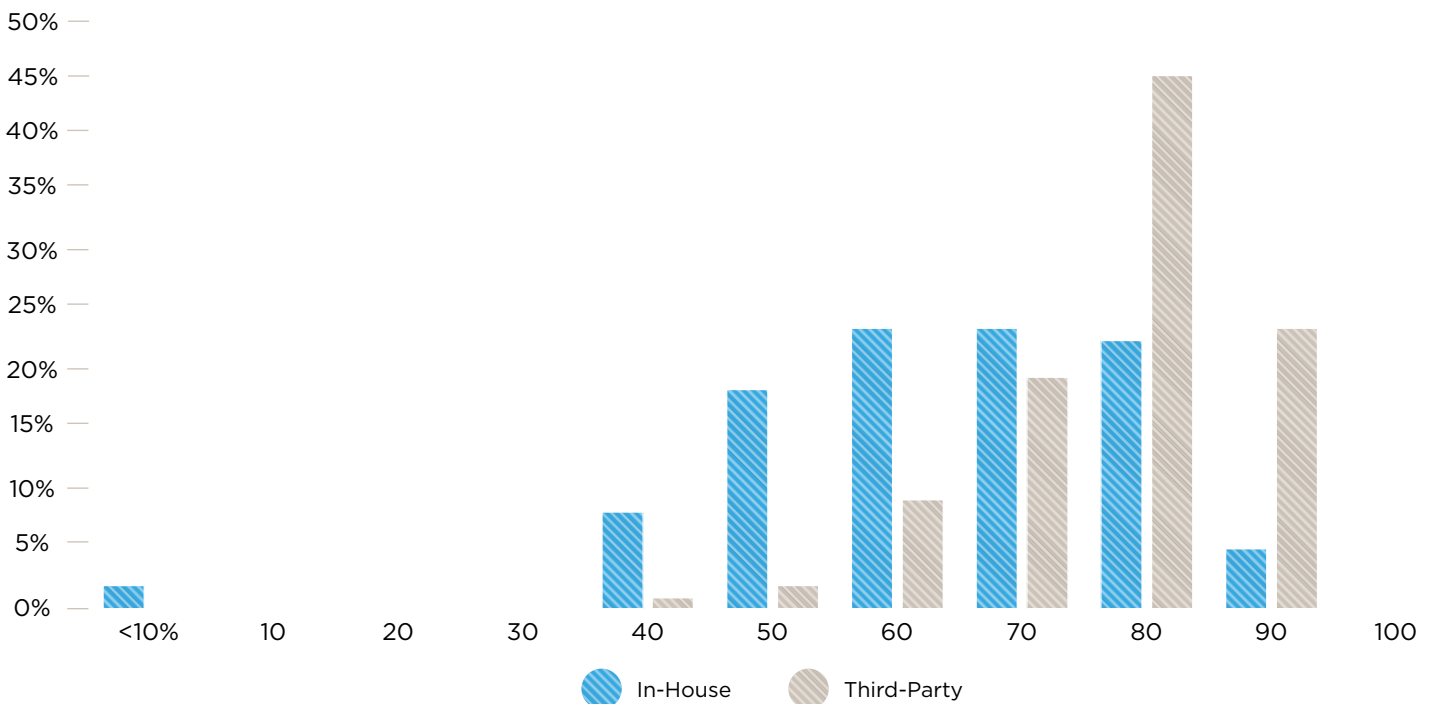
Amongst corporates, the requirement to maximise the efficient use of any IT environment, and thus minimising expensive under-used space, has meant that proportions are in-line with averages for third-party managed space (72%) but significantly above average (36%) reporting this high utilisation for their in-house managed facilities.

As with other users, service providers are driven by a need to maximise value for money regarding their third-party space, maintaining relatively high utilisation rates at about 76% in these facilities. In contrast, average utilisation rates amongst service/infrastructure providers of their own facilities tend to be lower at around 61%, allowing flexibility to respond quickly to new demand levels.

EXPANSION

Perhaps surprisingly, despite the underlying impact of COVID-19, over the past 24 months the profile of responses regarding the changes to in-house managed data centre capacity in the preceding six-month period, has remained largely constant. For the fifth survey in a row, around 63% of respondents reported that they had increased their internal data centre capacity, 20% have maintained previous levels, whilst the balance of 17% reduced their internally managed IT environments.

HOW HAS YOUR TOTAL FITTED TECHNICAL FLOORPACE ALTERED OVER THE PAST SIX MONTHS

	Expanded		**Reduced**		**Remain the same**	
	In-House	Third-Party	In-House	Third-Party	In-House	Third-Party
	63%	67%	17%	6%	20%	27%
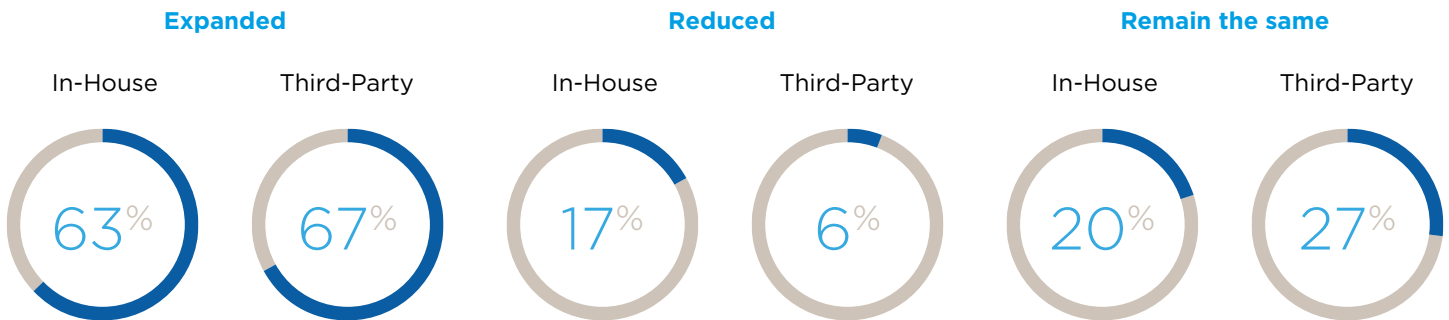
Amongst our service provider respondents, colocation operators continue to lead the way in terms of expansion, with some 88% indicating increases of their own stock during the previous six months; marginally higher than the 85% recorded in the autumn of 2020. This continued level of expansion provides clear evidence that these service providers stand behind strong demand forecasts from end-users in the short and medium term and are positioning themselves to respond quickly to meet this demand.

Amongst our corporate respondents, just 13% indicated an increase in their in-house technical floor space over the past six months; a fall from 20% recorded in our last survey. At the same time, we have seen an increase in the proportion who reported that they had reduced self-managed stock; 68% reported that this was the case, up from 55% six months earlier. The picture remains clear; in general end-users continue to favour an outsourced model for occupying data centre space where possible.

The survey has also identified a slight increase in the number of third-party managed data centre expansions since our last winter publication; some 67% of our respondents indicated an increase in the previous six months compared to 64% recorded at the end of 2020, and noticeably higher than the 54% recorded in the summer of 2019 – pre-COVID.

Amongst our end-users this proportion is even higher, with around 85% (compared to 83% previously) reporting they had increased their exposure to third-party data centre space. These recorded levels show that the benefits of externally managed IT infrastructure continue to prove attractive to corporate IT managers, and this trend has undoubtedly been accelerated during the past 18 months by the impact of COVID-19 with the increasing push to use cloud-based voice and data applications to meet changing work patterns such as homeworking.

HOW DID THEY DO IT?

The choice of routes for expansion of self-managed facilities in our latest survey are similar to those recorded in the latter half of 2020. The self-build route was again the most popular, with around 64% of respondents using it, a marginal uplift on the 60% recorded six months earlier, and noticeably climbing from the 58% logged in the Summer of 2019.

The option of purchasing or leasing through a development partner was followed by 20% of respondents, the same proportion recorded six months ago, but a rise on the 13% reporting 24 months ago, pre-COVID. Notably, around 18% reported that they have reduced their tech space through the decommissioning of a legacy facility, a rise on the 13% that we reported in our Summer 2019 edition with the majority of these being corporate end-users. Perhaps this provides more evidence that the pandemic has accelerated plans by corporate entities to shift their IT environments to externally managed strategy.

In terms of externally managed expansion, taking space from a colocation partner remains the most popular option with some 65% of respondents saying that they had chosen this route, followed by IT integrators, carriers and network providers. It should be noted that several respondents have chosen a multi-supplier route, suggesting that for those respondents who require a presence in a multitude of locations, the choice of route to market, is dependent on a "best in class" approach for individual locations rather than a single supplier.

EXPECTED CHANGES

The latest survey provides further evidence of a degree of ongoing positivity regarding expectations of future demand for data centre services. Despite the ongoing impact of COVID-19, respondents' indications of immediate expansion plans remain buoyant

The predicted expansion of internally managed data centre space, over the coming 12 months, has risen from 49% to 53% since the end of 2020 across all our respondent groups and continues to represent a significant recovery on the 21% recorded during the first half of 2020 and sits close to the long-term average.

Similarly, respondents' attitudes toward third-party managed space fairs considerably better than was the case in early 2020; 56% of responders reporting their intention to expand over the coming year, a substantial uplift on the 24% who reported a year ago, and a major increase on the 33% stating expansion intentions at the end of last year.

These rises can be tracked across all respondent groupings, although colocation operators and carriers have the greatest amount of confidence in expansion of in-house managed space, with around 75% and 60% respectively, recording an intention to grow over the coming year.

Notably, the number of respondents looking to reduce their data centre estate has continued to remain relatively low and close to the ten-year average monitored for both in-house and third-party managed space. For example, the proportion of respondents intending to reduce their in-house space is 7% compared to the 10% recorded in the latter half of 2020, whilst the proportion reporting that they would reduce their externally manged space has also experienced a small decline from 4% to 3%.

WHAT ARE YOUR CURRENT EXPECTATIONS FOR CHANGES TO YOUR 'IN-HOUSE' TECHNICAL DATA CENTRE AREA?

Expand — Remain same
Undecided — Downsize
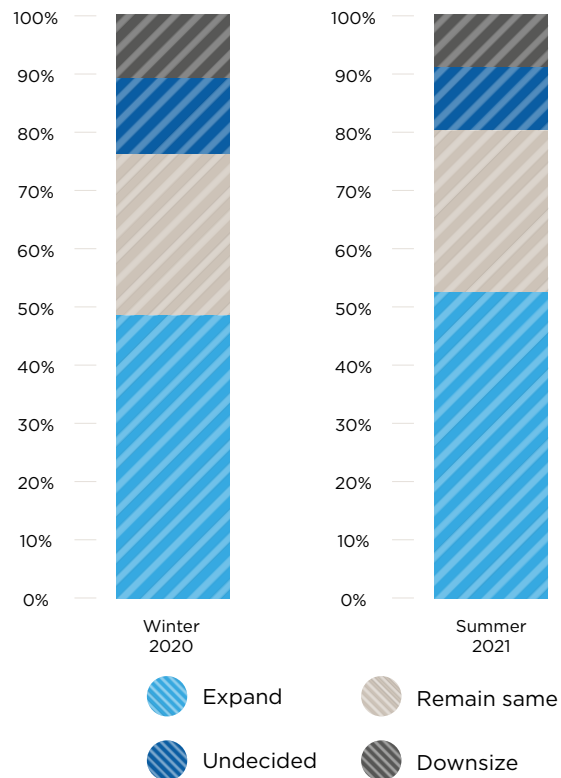
WHAT ARE YOUR CURRENT EXPECTATIONS FOR CHANGES TO YOUR 'THIRD PARTY' TECHNICAL DATA CENTRE AREA?

Expand — Remain same
Undecided — Downsize
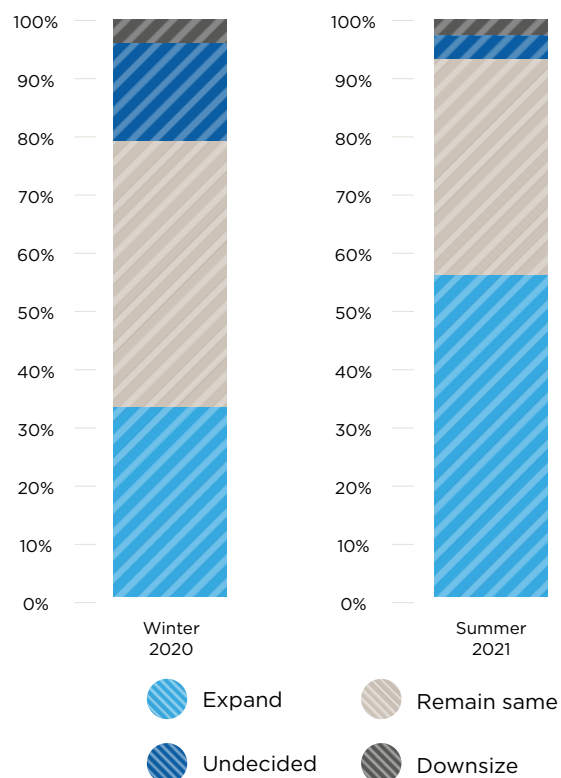
DRIVERS OF CHANGE

Since we started our survey work over a decade ago, business expansion or contraction has consistently been identified as the most highly ranked factor driving changes in both internal and third-party controlled data centres. This has been a clear message: companies have focussed on supporting business-generating IT infrastructure driven by the desire to improve and expand products and services to their users. Our latest results underpin this again, with just over 40% citing it as the top priority, a proportion un-changed from our preceding survey.

Whilst the availability of power has long been identified as an important factor when identifying a location for a new data centre, it has perhaps been surprising that changing power demands and costs has previously ranked relatively low down the order when looking at the drivers of change in data centre occupancy. Our latest survey suggests a notable change in this, with 17% placing it highly for both in-house and third-party operated space, an uplift from 15% and 11% respectively in our Winter 2020 survey.

The ranking of availability of appropriate data centre product by around 14% of respondents represents a significant increase on the 10% in our last survey, suggesting that there are nuances of demand amongst end-users and not all facilities provide the right product to all requirements. This is to be expected in a market that has become increasingly sophisticated both in terms of the delivery of product but also operationally, responding to an ever-changing end-user delivering an increasingly complex solution. Data centre operators continue to update and redefine new facilities to appeal to these changing requirements. However, older facilities may face problems of inefficient space or technologies which may require expensive modifications and upgrades to satisfy requirements.

In our previous survey, we noted a reduction in those who indicated budgetary issues as increasingly important; around 16% of respondents cited them as a reason. The latest survey has seen this proportion fall further back to around 10%, way below its long-term average of 21%. This reduced importance as a driver is noted in both in-house facilities and third-party managed floorspace. In contrast changes in fiscal structures are cited by around 11% of respondents, up from the 7% reported six months ago.

Changes in data sovereignty continue to be ranked near the bottom of the list, identified by around 9% of respondents, nearly twice the 5% that has been recorded as a long-term average and a slight up-tick from our survey last winter. As we noted last time this relative low score may be surprising given the continued lack of clarity regarding Brexit and the resulting data flow conditions between the UK and the European Union that at time of the survey have yet to be fully resolved.

WHAT FACTORS ARE/WILL BE DRIVING THESE CHANGES?

In-House   Third-Party

DEVELOPERS, INVESTORS AND FUNDERS
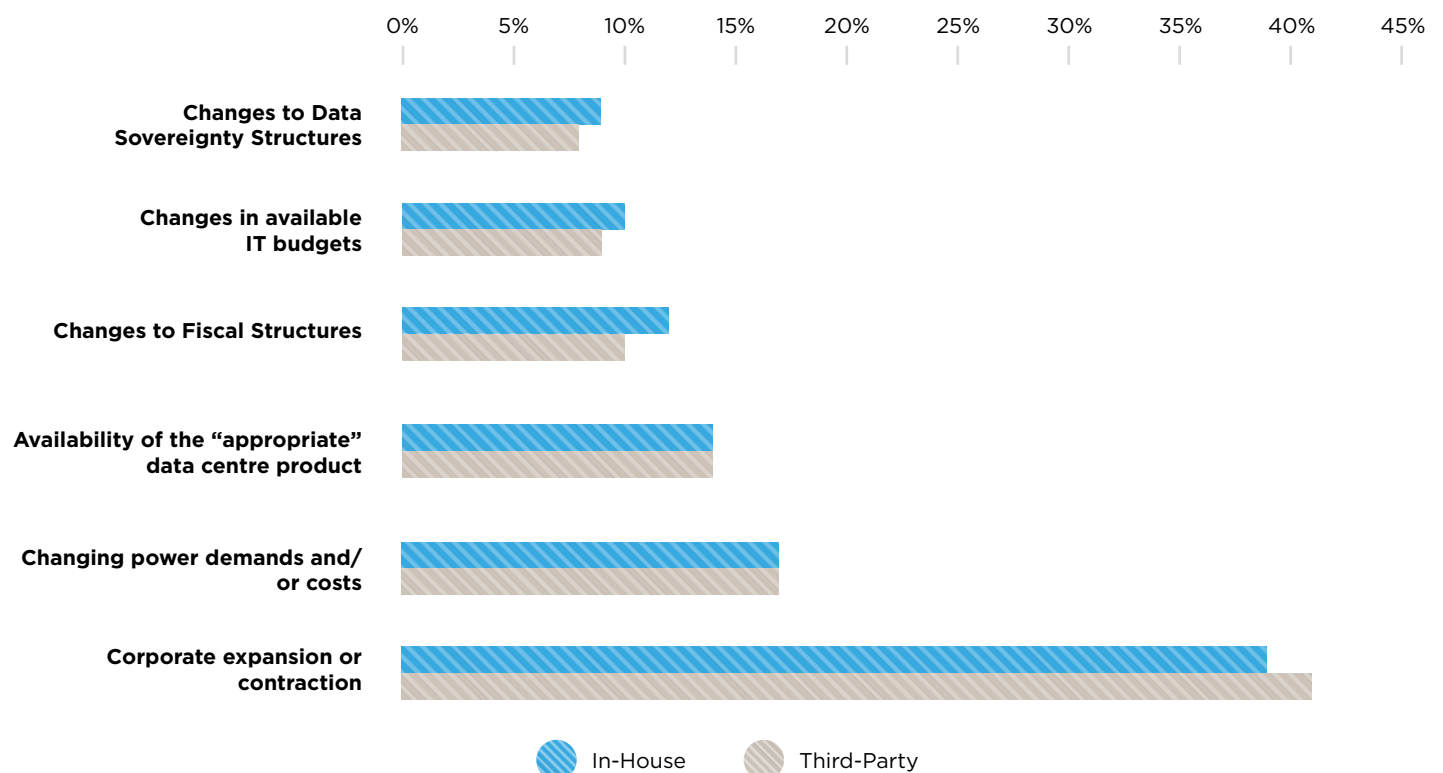
Despite the background of the COVID-19 crisis, developer sentiment has proven generally robust over the past year or so. Indeed, even with the difficult restrictions placed on them during the crisis – for instance staffing difficulties, supply chain disruptions - nine-out-of-ten of our developers and investor respondents reported that they grew their data centre stock in the past 12-month period.

Moving forward, there is little evidence that there is likely to be a slowdown in the delivery of new stock. A year ago, as the pandemic was beginning to take hold in Europe and uncertainty over how it would impact future economic performance was at its height, developer confidence as measured by expected expansion of data centre portfolios took a dip: some 45% of respondents stating they expected the following 12 months would see a growth in data centre stock, the lowest level we recorded since 2012. Exactly a year on, and we have seen a significant bounce-back to over 90% expecting to increase their portfolios over that period whilst no respondents suggested that they were looking to downsize.

PROPORTION OF DEVELOPERS EXPANDING DATA CENTRE PORTFOLIO IN THE PAST YEAR
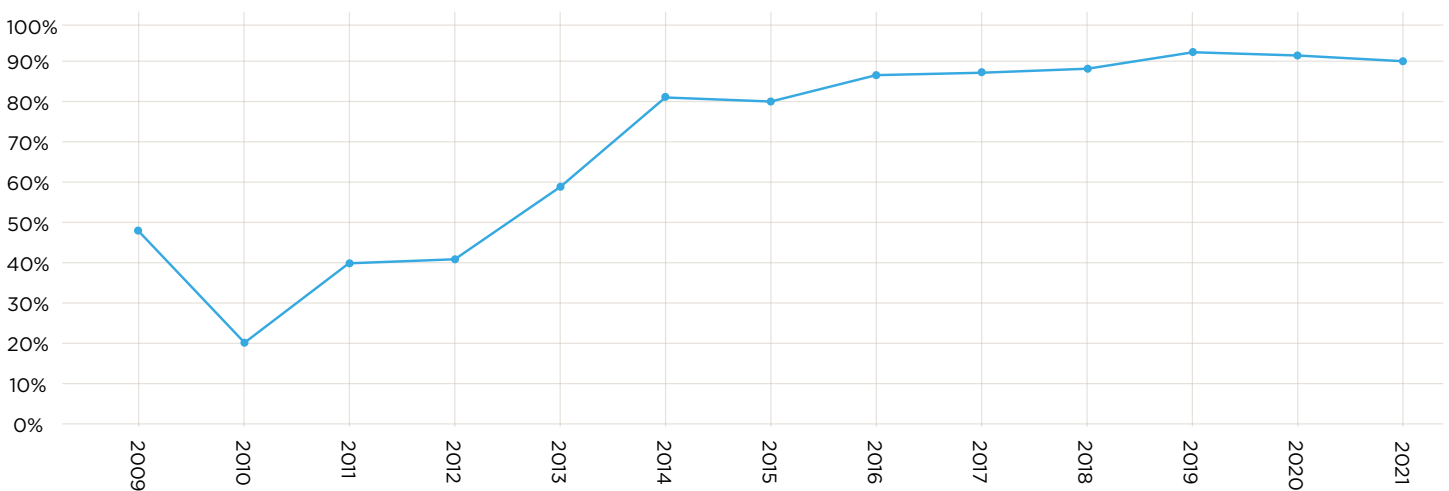
PROPORTION OF DEVELOPERS EXPECTING TO EXPAND DATA CENTRE PORTFOLIO
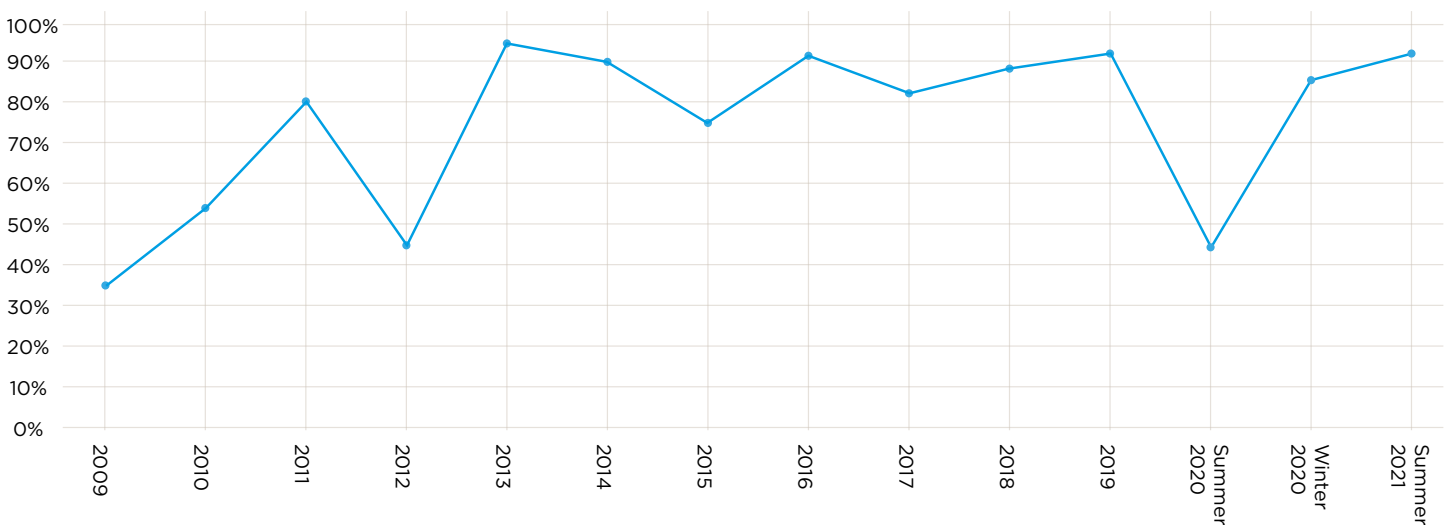
ATTITUDE TO RISK

A useful barometer to gauge prospects for the market in the short to medium term, is developers and investors attitude to risk. Monitoring the proportion of secured letting area that a scheme requires before construction can commence has been a benchmark that we have tracked over the past 12 years.

The results of our latest survey suggest that there is a rising degree of positive sentiment amongst developer respondents over the past six months with, on average, a lower degree of pre-letting required. The number of respondents requiring at least 75% or more of their scheme to be pre-committed has fallen from around two-thirds to around 59% this time around. However, it should be noted there was a further degree of polarisation that we have previously reported, with a notable increase in those that would require a 100% pre-let before green-lighting the build-out (15% - an uplift on 5%) but in addition the re-appearance of those who would/are building out 100% speculatively (5% compared to 0% last year).

IF IT IS YOUR INTENTION TO DEVELOP MORE TECHNICAL SPACE DURING THE NEXT 12-18 MONTHS, ON WHAT BASIS WILL THAT BE?
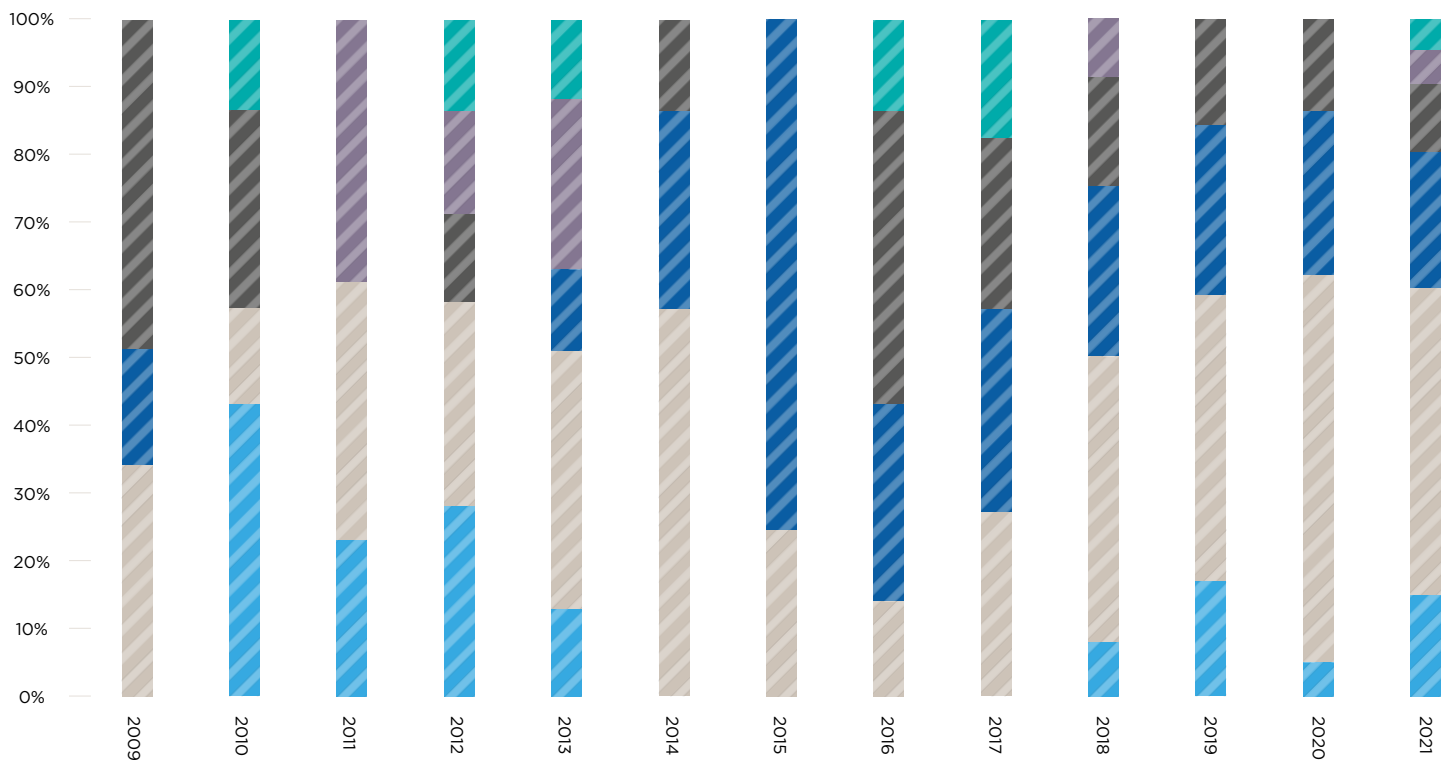
Proportion of pre-letting commitment needed to commence scheme

- 100% pre-let
- 75%-100% pre-let
- 50%-75% pre-let
- 25%-50% pre-let
- 5%-25% pre-let
- 100% spec

RANKING OF CHOICE FACTORS FOR NEW DATA CENTRE

The availability of power remains the single most important factor driving data centre choice amongst our respondents, with nearly three-quarters citing this as their number one choice in our latest survey. This represents an increase on the 62% who did so last winter. Indeed, amongst our developer and investor respondents the ability to have access to a secure and economic power source is rated even more highly, with around 85% placing it first.

Location remains as the second most popular factor, with just over half of all respondents ranking it at least in their top two choices, up from 40% six months ago and back close to the long-term tracking average. The proportion of respondents choosing it as their top choice stands at 16%, a proportion largely unchanged over the past three surveys and perhaps unsurprising bearing in mind the proliferation of Edge computing, a concept based on strategic data centre locations.

One factor which has become more popular is the availability of specialist data centre construction skills which is cited by around 7% of our respondents as the top ranked factor, more than double the 3% seen six months previously, providing some evidence of a potential skills gap growing in the industry. Interestingly, for our developer and investor respondents, following power availability, skills availability is the second most highly rated factor and sits ahead of the total build-out cost and land price.

Over the past few years Political/social stability has become increasingly more highly ranked by respondents. This may well reflect the unease felt across several European political and social landscapes as well as the wider global platform. The UK's exit from the European Union for example, has been a significant economic and political shift, with the fall-out on several major issues still uncertain and perhaps masked by the on-going focus on COVID-19. Long standing political differences in the Middle East have re-surfaced recently and doubts exist over the roll-out of a global vaccination programme in response to the COVID-19 pandemic creating further uncertainties. Just over a quarter of respondents have cited this social and political instability as one of their top two ranked factors, whilst this is below the jump to 45%, we reported six months ago, it is substantially above the long-term average.

DRIVERS SEEING DATA CENTRE CHOICE

Legend: 1 - Most Important | 2 | 3 | 4 | 5 - Least Important

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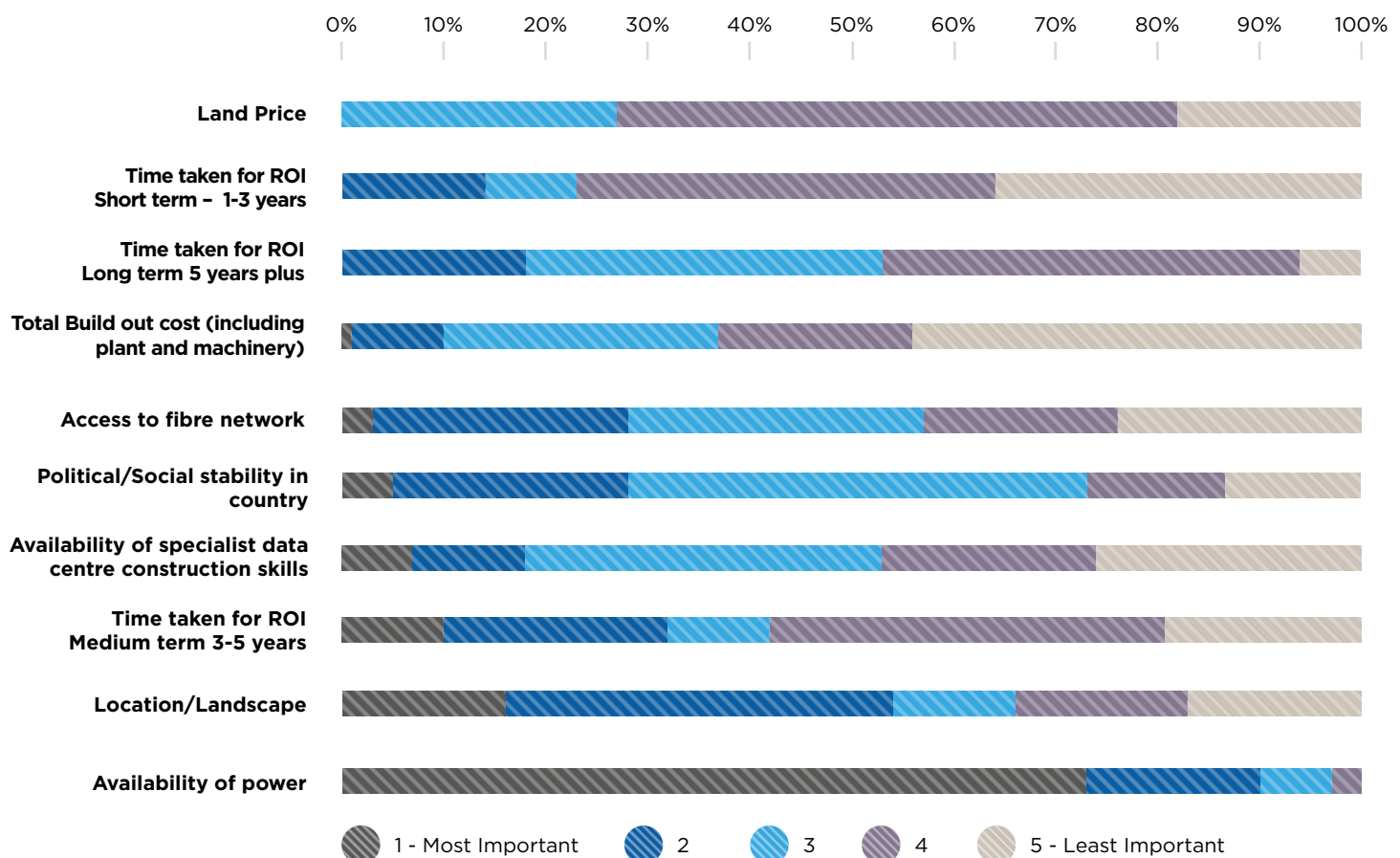
INVESTMENT FINANCE

The last few years have continued to see an increased level of interest amongst investors in the European data centre industry. This has translated into significant transactional activity via a range of routes including merger, acquisition, standing asset purchases and increased levels of finance provision to builders and operators. The increased attractiveness of the industry as an asset class has undoubtedly been driven by the ongoing global growth in data traffic which drives demand for the services the industry supports.

A range of factors are contributing to this growth including an increase in demand for public cloud services, a rise in as-a-service based offerings, the construction of infrastructure for 5G and IoT technologies, and the use of advanced technologies, such as big data, AI, and machine learning.

To support this rise in transactional activity we have seen a growth in both old and new forms of finance attracted to the industry in recent years. Whilst investment activity within the sector has historically been fuelled by new development activity focused on the real estate element of the market and M&A activity, as the market has matured and evolved a variety of both direct and indirect investment vehicles have responded.

For those established operators looking to expand, a major attraction of debt financing is that it provides funding without the need to release equity ownership. Debt financing is the foundation of new-build real estate and infrastructure projects in general and data centres are no exception. For the providers of such debt, the relatively high value of data centre assets makes them an attractive prospect.

Once a market is established a secondary market - re-financing and M&A activity - appears pointing to the growing maturity of the sector as early-stage investors seed and venture capitalist look to sell to institutional or other strategic investors. In general, most data centre projects are likely to encounter forms of both debt and equity finance over the course of their life cycle.

Against this background it is interesting to note the sources of finance provided and secured by our respondents over the past year. Indeed, multiple sources of finance were popular amongst our respondent base with around 40% reporting this, up from one-third recorded in 2020. In addition, just under half indicated that they had raised equity finance through their existing shareholder base in the last year, whilst a quarter reported that they had tapped specialist technology-focused funds for their route to raising finance. A further two-fifths of respondents reported securing bank debt funding over the period.

DESIGN, ENGINEERING AND CONSTRUCTION

THREATS TO THE INDUSTRY – SHORTAGE OF SKILLS

As the total amount of data created, captured and consumed in the world is forecast to continue to increase exponentially, few would argue against the importance of the need for a secure, flexible and efficient data centre infrastructure platform to house it. A potential threat to the delivery of sufficiency of new stock is a lack of sufficiently qualified professionals available to the industry, particularly in the fields of design and build. Potentially amplified by the effects of international lockdown on the movement of a skilled labour force to areas of demand, we have sought to understand how real this threat is according to our respondents.

WE WOULD LIKE TO KNOW HOW YOU CURRENTLY PERCEIVE THE DATA CENTRE SKILLS SUPPLY/DEMAND BALANCE

WINTER 2020 — SUMMER 2021

Significantly falling demand /Significantly rising supply

Stable demand/ Stable supply

Significantly rising demand/ Significantly falling supply

Colocation Operator · Carrier/Network Operator · IT Integrator/Cloud provider · Corporate Occupier · Real Estate Developer/Investor · Design/Engineering/Construction · Other Inc Consultant etc

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- Across our respondent groupings there remains real concern over a skills shortage in the data centre industry. Some 90% of respondents believe that the coming year will see a decline in supply of staff, around the same amount (93%) reporting this in Winter 2020, arguably at the height of the COVID-19 crisis across Europe.
- To further exacerbate the problem, some 70% believe that this will be accompanied by a rise in demand for such staff.
- For the second survey in a row there is near universal agreement amongst our developer respondents, that the coming 12-month period will see a fall in supply of staff whilst the demand for those skill sets rises; the highest degree of assent amongst all our respondent's groupings.
- In addition, Design, Engineering and Construction (DEC) respondents share an almost identical response profile, universal belief that the next year will be characterised by a fall in supply of staff whilst the demand for those skill sets rises. This reflects a hardening of attitude on this issue contrasted with the 72% reporting this just six months ago.
- In contrast, colocation providers have maintained the same level of concern since our last survey, with nearly 90% predicting increasing demand levels for skilled workers against a falling supply in the next 12 months.
- Integrators and carriers also expressed a similar degree of concern compared with six months ago; almost universal agreement that supply would fall over the period. Where they differ is in the degree of concern with 19% of carriers couching their agreement in the strongest possible terms.
- Corporate respondents also registered a higher degree of concern over a potential skills gap, albeit more muted than our supplier sections. Amongst end-users, 62% believe that rising supply of skilled staff would be met with falling demand - up from the 40% who shared this view six months ago.

WHO IS IN SHORT SUPPLY?

WITH REGARD TO THE DESIGN/BUILD/OPERATIONS OF DATA CENTRES IN EUROPE WE BELIEVE IT IS INCREASINGLY DIFFICULT TO SOURCE SUFFICIENTLY SKILLED DESIGN PROFESSIONALS TO DELIVER OUR CURRENT PROJECTS

Design — Winter 2020, Summer 2021
Build — Winter 2020, Summer 2021
Operations — Winter 2020, Summer 2021

Legend: Strongly Agree · Agree · Neither Agree nor disagree · Disagree · Strongly Disagree
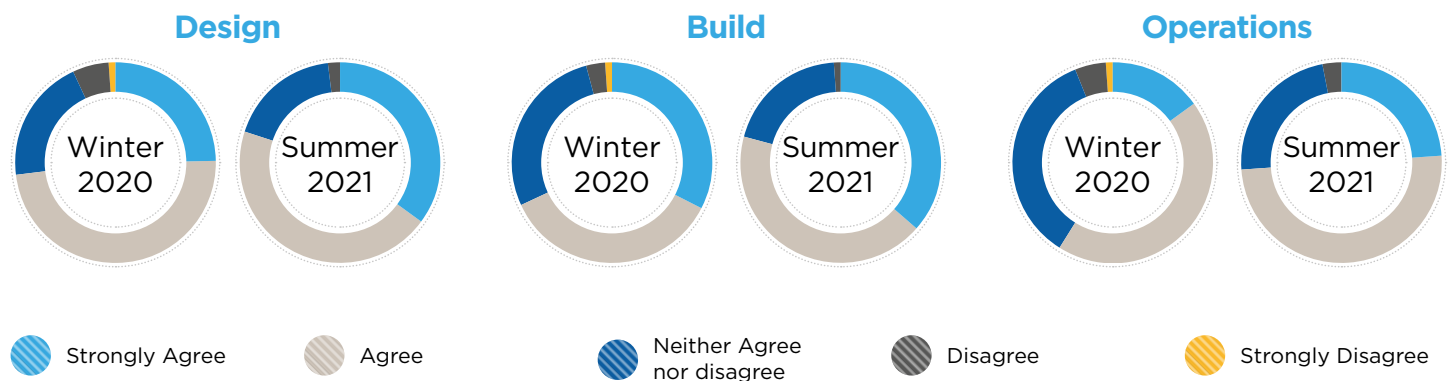
Over the last six months, we have noted an increase in the number of respondents concerned about potential problems arising from shortages specifically amongst design professionals; from 74% to over 84%. Within this we have seen a more pronounced rise in the number of respondents expressing their belief in the strongest terms – up from 25% to 37%. It should be noted that this level of concern is the highest we have recorded in the last six years, a period where we have seen a slow rise in the overall trend in concern amongst stakeholders in the European data centre industry.

At the build stage, the problem appears to be just as acute, with this survey registering an increase in those that both agreed and agreed strongly. Indeed, nearly 80% of the segmented supply specialists expressed their concerns that a shortage of sufficiently skilled build contractors existed, an increase on the 69% who suggested the same in the second half of 2020.

According to our respondents the difficulties in sourcing operational staff are slightly less pronounced than at the design and build stages. Around three-quarters expressed their agreement when asked about the shortages of sufficiently skilled operations staff, an increase on the 69% reporting it in the previous survey.

The strength of agreement does vary amongst the groupings, albeit not as pronounced as in other categories. Perhaps not surprisingly our DEC respondents expressed their concern over skills shortages in the most robust terms, with almost universal agreement that shortages exist at both the design (98%) and build (92%) stages.

Amongst our service providers the strength of belief in design and build skill shortages is slightly less pronounced, nevertheless, over 90% of these respondents agreed that shortages are problematic.

For end-user respondents, a belief in shortages of skilled operational staff pose the biggest problem – 72% compared with just 22% for design professionals and 17% for build professionals. Many end-users adopt neutral position on these categories, perhaps not surprising given the increasing popularity of outsourcing solutions meaning many of these are not exposed to the early stages of data centre delivery and as such have limited direct experience of the problems associated with it.

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In terms of job shortage concerns, there appears to be widespread agreement that these are spread across a variety of specific job roles. Indeed, most respondents identified multiple roles as areas of concern. In the construction sector almost two-thirds of respondents stated that they had experienced shortages of quantity surveyors, site managers and site engineers within the past year.

Within the operational sphere, around 70% of respondents stated that they have had direct experience of shortages amongst operations and network engineers/technicians over the last 12 months, with a slightly lower proportion – around two-thirds - seeing a shortage of infrastructure specialists over that period. Also worthy of note, Mechanical & Electrical project managers were also highlighted as an area of concern around the availability of skilled workforce – just over 60% cited shortages amongst this skill set as problematic.

IMPACT OF THESE SHORTAGES

The skills shortage debate is set within the context of the potential impact for the delivery of stock to the end user. Evidence from this survey suggests that these shortages have already had real consequences and directly impacted on respondents. When questioned about what impacts they had experienced because of these shortages in the past year, most respondents cited multiple factors.

The most cited impact is that these skills shortages have placed a greater workload on existing staff, nearly nine-out-of-ten cited this as the case, an uplift from the eight-out-of-ten recorded six months ago.

The shortage of staff has inevitably led to increasing operating/labour costs recorded by 86%, a rise from the 70% who cited the same factor in Winter 2020. Such shortages also can be seen as a contributory factor in the increasingly popularity of the use of outsourcing options, with around 60% citing it as such.

IN THE PAST YEAR WE HAVE EXPERIENCED THE FOLLOWING AS A DIRECT RESULT OF SKILL SHORTAGES
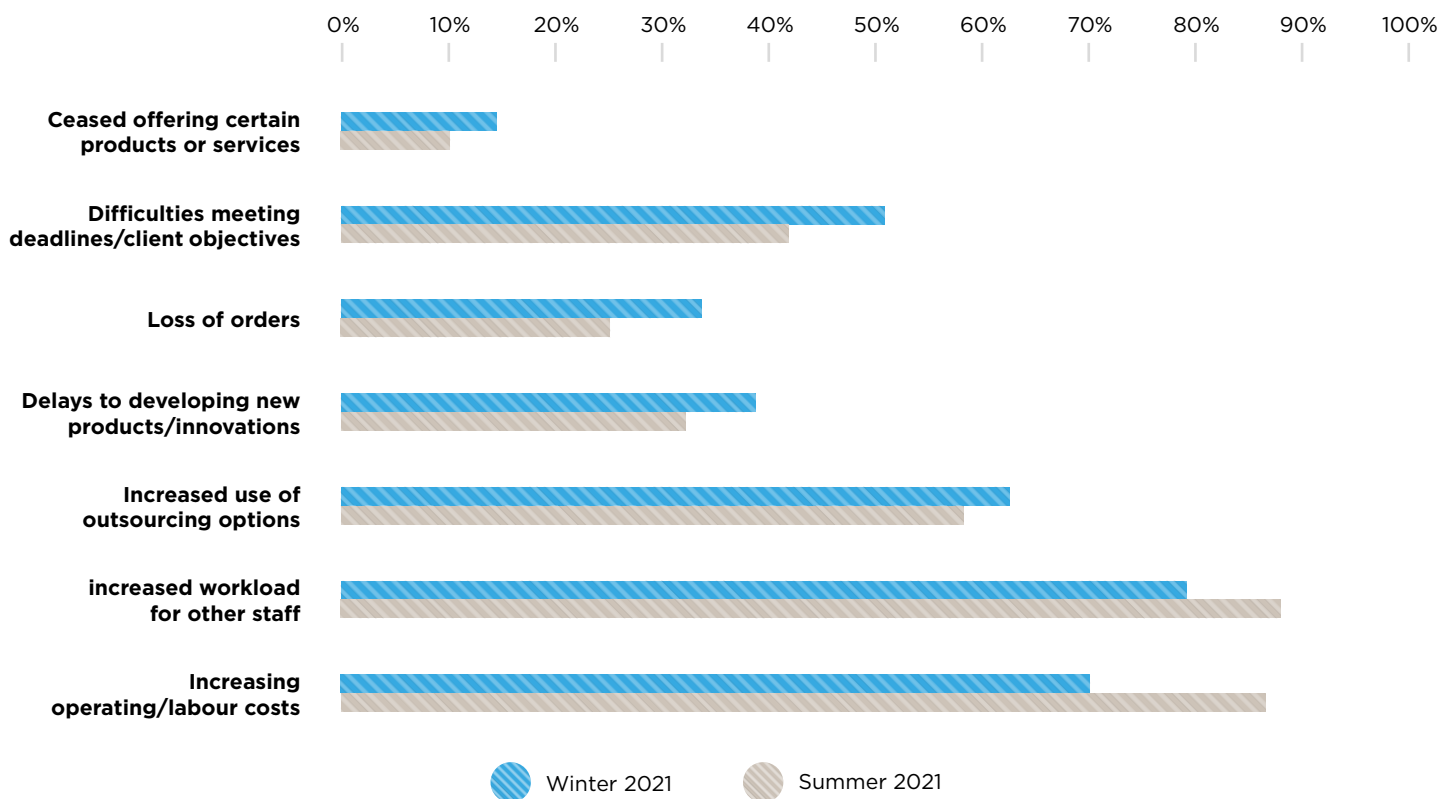
Encouragingly, it appears that fewer respondents are finding it difficult to resource existing work this year than was the case in 2020, with just over 40% stating that they had experienced difficulties in meeting deadlines or client objectives, down from 51% six months ago and some 70% who cited it as factor at the beginning of the pandemic 12 months ago.

However, the more extreme consequence of skills shortages is lost orders, with a quarter of respondents still believing that this happened, although this is a fall on the one-third identified six months ago.

In addition, around a third stated that shortages had led to delays to developing new products/innovations, marginally down on the 39% recording this in our last survey, whilst the proportion that noted they had ceased offering certain products or services has fallen positively to 10% from 14%.

AS AN OPERATOR IN THE EUROPEAN DATA CENTRE MARKET, PLEASE RANK THESE TOP FIVE FACTORS IN ORDER OF DIFFICULTY TO MANAGE

NEW OPERATOR

- Planning System (Planning/permits/regulation)
- Contractual approach/Project admin e.g. workforce issues
- Design/management approach
- Construction methodology
- Design and build standards

ESTABLISHED OPERATOR

- Planning System (Planning/permits/regulation)
- Contractual approach/Project admin e.g. workforce issues
- Design/management approach
- Construction methodology
- Design and build standards

Rank 1 — Rank 2 — Rank 3 — Rank 4 — Rank 5

When questioned on the topic six months ago, the area in which these new entrants had most difficulty operating within the European data centre market was the Planning System, ranked as the top area of concern by almost two-fifths of these respondents and in the top two positions for nearly two-thirds. Our latest survey shows the issue is now more problematic with at least half of new entrants ranking the Planning System as the top factor and three-quarters placing it in their top two positions.

Interestingly, the Planning System is also ranked as the top area of concern by established operators - almost two-fifths of these respondents rated it as number one and 60% in the top two positions. Amongst our established developer respondents almost all cited issues on planning, permits and regulation as the top factors.

The next most highly ranked factor amongst both our new entrants and established enterprises was Contractual approach/Project admin. Given the varied contract and labour laws across the European nations where some offer less flexibility and cause greater costs than others, it is unsurprising that this can cause issues not just for new entrants but for those established enterprises operating across different European markets.

Where our respondents' groups did vary was in their ranking of Design/Management approach as an area of difficulty which was rated third by established enterprises but fifth by new entrants. In addition, for new entrants Design and Build Standards and Construction Methodology were ranked lower than for established enterprises suggesting that within the design and build process there is more uniformity across the global data centre market reflecting a professional industry that has seen mobility of methods of practice and skillsets.

COVID-19

IMPACT ON BUSINESS

There is little doubt that the COVID-19 pandemic has caused unprecedented disruption across the world over the past 18 months. In our latest survey Increased workload for staff was identified as the top ranked direct impact on business because of COVID-19, with some 24% citing it as such. Indeed, amongst our end users, this proportion rises to around half. To some extent this may be a result of access to data centres being limited to essential work and maintenance only and also as a result of stretched workforces due to illness or self-isolation.

Looking forward, Increased workload for staff falls to the third most highly ranked factor, a sign perhaps that our respondents are expecting a return to normal or at least better staffing levels in the future as lockdown measures are eased and vaccination programmes reduce illness.

COVID-19 – DIRECT IMPACTS ON BUSINESS - HISTORICAL
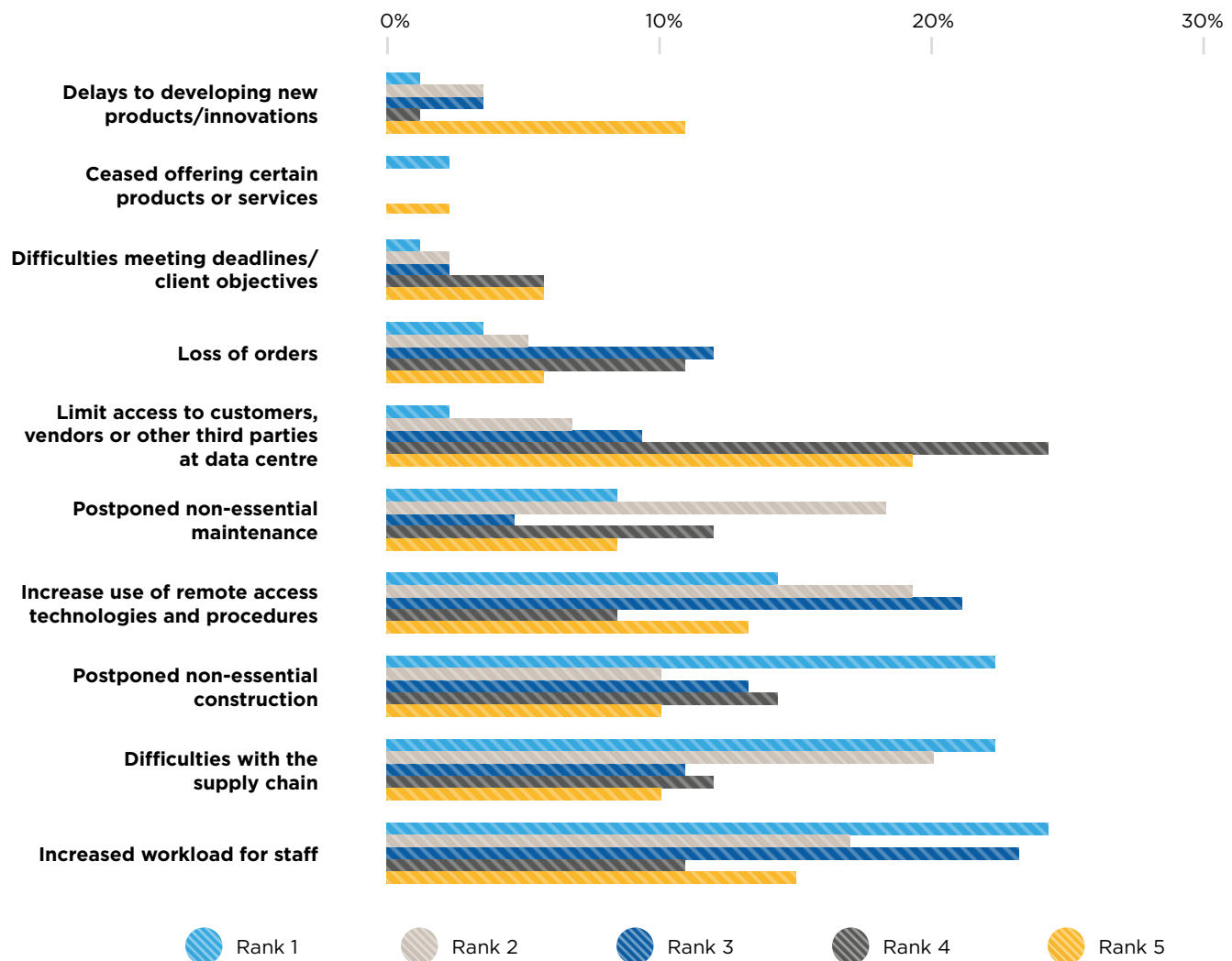
Six months ago, difficulties with the supply chain were cited high as a pain factor amongst respondents, with a quarter placing it at the top of their list. This time we have monitored a slight decline on this number to 22%. However, notably amongst our DEC respondents this number rises to around two-thirds placing it as their top factor. This proportion - considerably above the rest of the respondent base - suggests that those charged with the delivery of new stock have experienced considerable difficulties in sourcing the right materials in a timely manner to fulfil their workloads.

There is little sign that these difficulties will disappear soon. Moving forward, supply chain difficulties are by far the most highly ranked likely impact with around two-fifths of our respondents citing it. Amongst our developer and investor respondents, this proportion rises to 71% whilst around half of DEC responders expect further disruption.

This will undoubtedly reflect the fact that the European data centre industry is very reliant on a global supply chain to support the complex areas of Mechanical and Electrical build-out. With some global economies still locked down and others emerging slowly, traditional sources of materials (from base construction materials to more complex M&E components) may be more difficult than before and securing alternative sources similarly problematic due to pent-up demand.

One positive impact of the pandemic has been the increased use of remote access technologies and procedures. This is positive in that these tools allowed work to take place remotely, limiting physical access to facilities and protecting the key staff. For the past two reports, the factor has been highly ranked and in this latest survey this remains the case, with a third of our respondents placing it in their top two choices. Notably, amongst our service providers – arguably those with the most day-to-day experience of these technologies, this proportion rises to some 41%.

COVID-19 – DIRECT IMPACTS ON BUSINESS - EXPECTED MOVING FORWARD
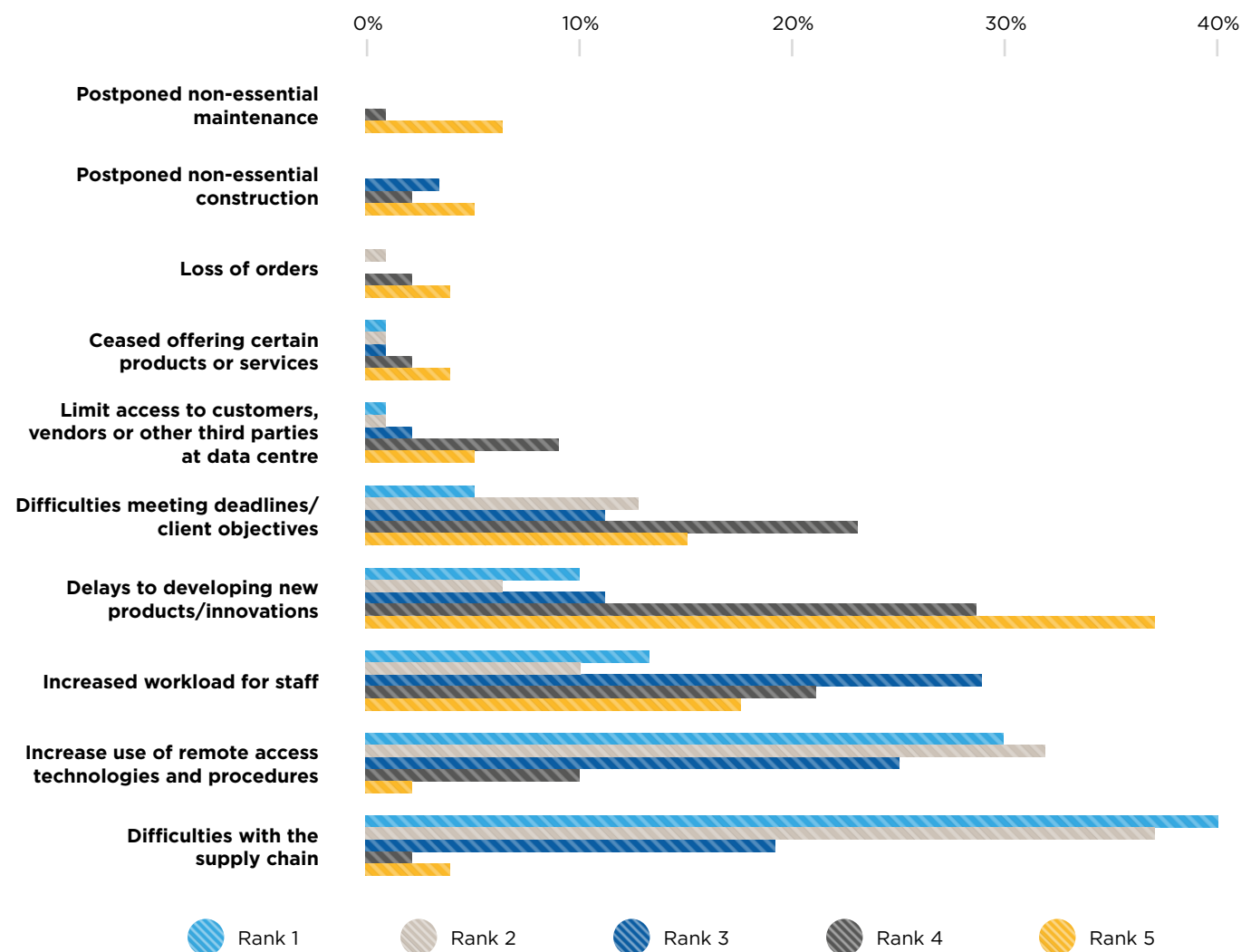
Limiting access to customers, vendors or other third parties at the data centre and postponed non-essential maintenance are all factors reflecting the need to minimise the risk for working staff and to adhere to Government guidelines. As lockdowns and social distancing measures have eased - at least in some locations - more staff should be physically returning to work as these protocols and restrictions are relaxed.

For others – around one-fifth - the physical access to the data centre portfolio is still expected to prove to be problematic due to limited access and essential staff only. Restrictions on customer access in areas of high pandemic rates are likely to remain in place for the near future.

Encouragingly, our latest survey has seen Loss of orders fall behind as a highly cited outcome, with just 3% indicating it as the top ranked factor, and no responders ranking it most important looking forward. In addition, the fall in ranking of factors such as delays to developing new products/innovations and ceased offering certain products or services indicates that fears that we were going to suffer significant recessionary periods which would impact negatively on non-essential demand have perhaps subsided.

INCREASED SPENDING ON CLOUD

Over the past decade spending on cloud products has grown substantially as the popularity of outsourced infrastructure and applications and the working efficiencies that they allow, proved increasingly attractive to enterprise balance sheets. The pandemic has accelerated the provisioning of these services as the need to maintain productivity in the wake of the COVID-19 impact saw the exponential rise in remote working practices.

COVID-19 – WE INTEND TO SPEND SIGNIFICANTLY MORE ON CLOUD-BASED PRODUCTS THAN HAS BEEN PREVIOUSLY PLANNED.
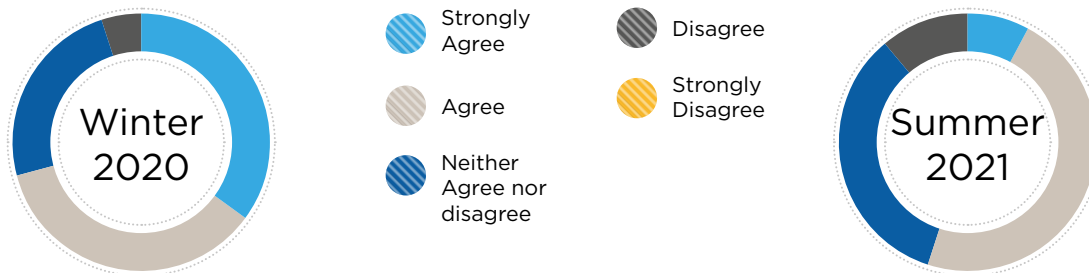
When asked in our winter 2020 issue, around three-quarters of respondents agreed that the impact of lockdown would see an acceleration in the move to cloud-based voice and data systems, with just 3% disagreeing. Six months on, some 55% now agree they will increase budgetary spend on cloud products over and above what they had already committed, whilst a third have adopted a neutral position and 11% disagreed.

It is notable that the highest level of agreement came from our service provider group – almost 60% said they did intend to spend more. In contrast, for end-users this proportion fell to around 40%. It may be in the case of the former, they are pushing further ahead in cloud innovation areas such as Artificial Intelligence and the Internet of Things which are anticipated to provide further demand for cloud services.

CLIENT IMPACT ON OPERATORS

The fallout from the pandemic on the global economy is unlikely to be truly evident for several years. Whilst best case scenarios suggest that there will see a rapid recovery in economic activity, there is a strong likelihood that not all sectors will recover as easily or quickly as others. Whilst it seems that data centre providers servicing enterprise and organisational IT needs have performed relatively well over the past year, some of its clients may have fared less well.

COVID 19- DATA CENTRE OPERATORS - CLIENT IMPACTS

Enterprises from the retail, tourism and hospitality sectors, for example, are widely reported to have experienced falling volumes of activity in the wake of lockdowns and other social distancing measures. Whilst sectors can adapt, evolve and recover, a downturn in economic activity for a period, a prolonged bottleneck on both the demand and supply chains may see individual enterprises struggle. This in turn can have a determinantal effect on those - including the data centre industry - who supply services to those impacted.

Postponement of expansion plans by clients remains the most common complaint amongst respondents, with around 60% stating they had experienced this over the period. Given difficulties most have experienced in accessing facilities that have been largely run with essential staff only, this is not surprising. Given our earlier positive survey findings in terms of responders' expectations on expansion plans, this postponement is hopefully to be short-term in nature.

In addition, we have seen marginal uplift in those operators reporting they have negotiated the length of contract with a client. One-in-four of our operators reported that clients had discussed this course of action.

The worst-case scenario for operators involves tenant default, with 5% reporting client liquidation or insolvency during the period: a proportion unchanged from our preceding survey. More positive news comes from a decline in the number reporting having experienced delayed payments - around 7% cited this which stands at half the levels seen in our winter survey.

POWER

BCS INTEGRATED SOLUTIONS

The fortunes of the data centre industry are inextricably linked to the ability to source and utilise power in the most efficient and cost-effective manner. The impact of power runs across every aspect of the market from informing decisions on data centre site selection, through the design and construction phases and the operation of such facilities. With forecast growth for digital services likely to remain substantial, the industry continues to respond to power issues created as a result, with the question of sustainability arguably never so important as it is today.

CONSUMPTION UNLIKELY TO DIMINISH

According to the International Energy Agency, data centres accounted for around 1% of the world's total electricity use in 2019. This is set to rise as the digital world grows, with some estimates including research conducted by Huawei Technologies life cycle assessment senior expert Anders Andrae, suggesting could reach 3% of global electricity use in 2025.

However, predictions of a doubling and tripling of energy consumption have previously not materialised to the extent that some were convinced would happen, which may have been due to several factors. First, as the globe moves towards a more electric-driven consumption model (including cars but also in general day-to-day life) then the data centre industries gross consumption may also be rising, but in line with this which means its % could remain balanced. Second the energy efficiency of IT devices has improved substantially due to steady technological progress by IT manufacturers. Third, greater use of server virtualization software, which enables multiple applications to run on a single server, has significantly reduced the energy intensity of each hosted application, and fourth most compute instances have migrated to large cloud and hyperscale-class data centres, which utilise ultra-efficient cooling systems to minimize energy use.

Any growth in demand provides an ongoing challenge for the industry as it moves to source sustainable power. Our latest survey provides further evidence of the extent of this challenge, with around three-quarters of surveyed professionals expecting their levels of consumption to rise over the next three years, a proportion marginally above the long-term tracked average. Over two-fifths expect this rise to be significant whilst a further 19% expect their levels of consumption to at least remain stable. Notably, only 8% are expecting to see a reduction.

OVER THE NEXT THREE YEARS, WE EXPECT OUR POWER PER SQ METER CONSUMPTION TO:

- Rise Significantly
- Rise Marginally
- Remain the same
- Decline Marginally
- Decline Significantly

AVERAGE RACK POWER/COOLING LEVELS TO RISE?

Just over a quarter of respondents expect to see an average rack power/cooling level of 9kw-12kw over the coming year, a marginal increase on that reported in our survey at the end of 2020. In addition, a further quarter expect to see an average rack power/cooling level move to 12kw-15kw over next 12 months; a marked increase on the 14% noted in the same survey. Only a small proportion of our respondents (7%) indicated that they would see a level higher than 15 kw per rack.

Amongst our corporate respondents, around one-third are expecting to see average rack power/cooling level of 3kw-6kw by next summer whilst a further 30% suggest their average levels will be in the 6kw-9kw range.

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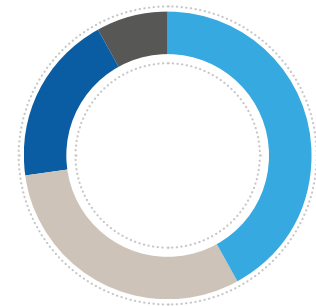
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COST OF POWER – AN EFFICIENCY DRIVER

The desire for efficiency is one of the core tenets for most organisations business plans. Therefore, it is perhaps not surprising that faced with rising costs, enterprises will look for efficient solutions to limit their exposure to such increases.

As a result, two-thirds of our respondents believe that an expected rise in power costs in Europe will see demand levels for power efficient data centre space rise over the next three years. Amongst our service providers, some 76% share this view whilst 84% of developer and investor respondents concur, whilst just 40% of our end-users are in agreement.

MOVE TO RENEWABLES

Encouragingly, over the course of the next decade, a large proportion of our respondents (84%) expect to see at least 90% of their data centre energy usage to be sourced from renewable forms, with just 5% disagreeing. This profile of response is replicated to a large extent across all of respondent groupings. Maybe more significantly, our developer and investor respondents are almost universal in their agreement that the majority of their power will stem from renewable sources.

Any expected rise in power consumption underlines the need for the continuing development of more efficient power delivery and usage methods to ease both the likely financial burden associated with the rise, as well as any legislative or ethical need to adhere to a greener imperative.

There is little doubt that the industry as whole – both providers and end users - are committed to moving away from non-renewable sources of energy for power. There are several industry initiatives attempting to address this. For example, the Climate Neutral Data Centre Operator Pact and Self-Regulatory Initiative - a group of European cloud infrastructure and data centre providers and trade associations who want to try to ensure that data centres in Europe are carbon neutral by 2030.
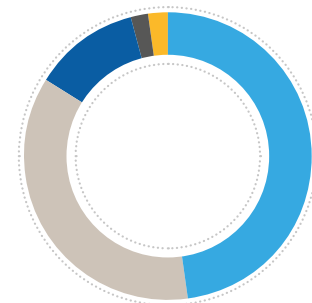
The industry is seeking to support the European Data Strategy and the European Green Deal, which aims to make Europe the world's first climate-neutral continent by 2050. In addition, many of the major enterprise users have also stated their commitments to using 100% renewable energy at their data centres including Facebook, Google, and Apple.

WE EXPECT THAT THE SOURCING OF POWER FOR OUR DATA CENTRE IN 2031 WILL BE 90% OR MORE SOURCED FROM RENEWABLE SOURCES

- Strongly Agree
- Agree
- Neither Agree nor Disagree
- Disagree
- Strongly Disagree

Given this context we questioned our respondents on where their current power needs are sourced and their expectations moving forward as to where their power needs are likely to satisfied from. It is perhaps surprising that at present only around 10% of our responders secure their energy from a single source. This may reflect the global nature of some of our respondents with a multitude of facilities across their portfolio meaning that they are likely to source power as and when securing the best in class for individual facilities. This can be dictated by different local and national policies on sourcing power for the grid which can vary greatly across Europe. For example, around 70% of total electricity production in France is sourced from nuclear power whilst in Denmark, 80% of the electricity produced in the country stems from renewable sources.

Encouragingly of those who source energy solely from finite natural resources such as gas and coal, totals only around 5% of our respondents. Interestingly a similar proportion are 100% reliant on one single source of renewable power currently.

Further encouraging news is that 18% of our respondents' data centre portfolio floorspace is sourced only from a mix of renewable sources including solar, hydroelectric/tidal, and wind farms/turbines.

CURRENT VERSUS FUTURE SOURCES OF POWER FOR DATA CENTRE FACILITIES
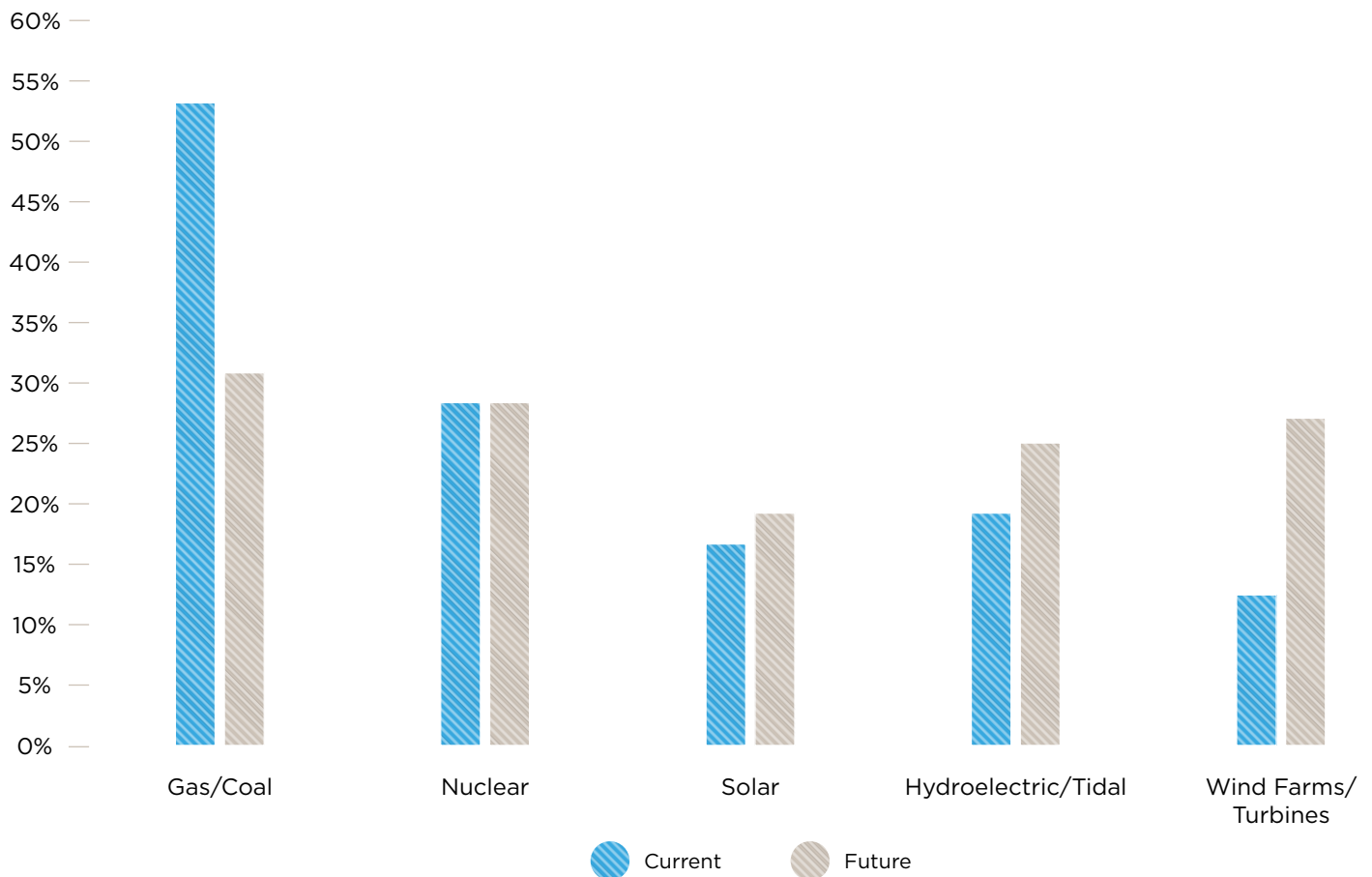
It should be noted that just over half of our respondents utilise some degree of gas or coal power in their facilities, whilst nuclear power is used as a source of power by around 27% in a least part of their portfolio.

Moving forward we asked our respondents to try to assess their expected average share of sources of power across their data centre real estate in the next five years. Whilst only around 7% suggest that their facilities will be sourced from a single type of renewable power, most respondents expect to see a rise in the proportion of power from renewable sources – solar, hydroelectric/tidal and wind farms/turbines – which will service their data centre facilities.

The expected move away from fossil fuel-based energy sources is evidenced by the reported total of respondents who utilise some degree of gas or coal power in their facilities at present – just over 50% - which declines to an expected 30% over the next five years. In addition, nuclear power is expected to remain as a source of power by 28% of respondents on a least part of their portfolio.

MEET THE EXPERTS

If you would like to hear more, please get in touch.

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